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Date: August 6, 2004

By: [Signature]  
Key L. Gaviglio

**PATENT**  
**Docket No. GC566-2-C1**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In Re Application:	)	
	)	
Jones et al.	)	Group Art Unit: 1614
	)	
Serial No.: 10/791,093	)	Examiner: Unassigned
	)	
Filed: March 1, 2004	)	
	)	
For: CHEMICALLY MODIFIED MUTANT SERINE	)	
HYDROLASES SHOW IMPROVED	)	
CATALYTIC ACTIVITY AND CHIRAL	)	
SELECTIVITY	)	

**Information Disclosure Statement**

Box Amendment  
Commissioner for Patents  
P. O. Box 1450  
Alexandria, VA 22313-1450

Sir:

Applicants submit herewith patents, publications or other information (listed on the attached Form PTO-1449 and attached thereto) of which they are aware, that they believe may be material to the examination of this application and in respect of which there may be a duty to disclose in accordance with 37 CFR §1.56.

This Information Disclosure Statement:

- (a) ☐ accompanies the new patent application submitted herewith. 37 CFR §1.97(a).
- (b) ☐ is filed within three months after the filing date of the application or within three months after the date of entry into the national stage of a PCT application as set forth in 37 CFR §1.491.
- (c) ☒ as far as is known to the undersigned, is filed before the mailing date of a first Office Action on the merits.
- (d) ☐ is filed after the first Office Action and more than three months after the

application filing date or PCT national stage date of entry filing but, as far as is known to the undersigned, prior to the mailing date of either a final rejection or a notice of allowance, whichever occurs first, and is accompanied by either the fee (\$180.00) set forth in 37 CFR §1.17(p) or a certification as specified in 37 CFR §1.97(e), as checked below. Authorization to charge Deposit Account No. 07-1048 in the amount of \$180.00 to cover the cost of this Information Disclosure Statement is provided in the Transmittal Letter submitted herewith in duplicate.

(e) ☐ is filed after the mailing date of either a final rejection or a notice of allowance, whichever occurred first, and is accompanied by authorization (in the Transmittal Letter submitted herewith in duplicate) to charge Deposit Account No. 07-1048 the fee (\$180.00) set forth in 37 CFR §1.17(l)(1) and a certification as specified in 37 CFR §1.97(e), as checked below. **This document is to be considered as a petition requesting consideration of the Supplemental Information Disclosure Statement.**

**[If either of boxes (d) or (e) is checked above, the following "certification" under 37 CFR §1.97(e) may need to be completed.]** The undersigned certifies that:

☐ Each item of information contained in the Information Disclosure Statement was cited in a communication mailed from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this Information Disclosure Statement.

☐ No item of information contained in this Information Disclosure Statement was cited in a communication mailed from a foreign patent office in a counterpart foreign application or, to the knowledge of the undersigned after making reasonable inquiry, was known to any individual designated in 37 CFR §1.56(c) more than three months prior to the filing of this Information Disclosure Statement.

Those patent(s) or publication(s) which are marked with an asterisk (\*) on the attached Form PTO-1449 are not supplied because they were previously cited by or submitted to the Office in a prior application, Serial No. 09/436,513, filed November 9, 1999, and relied upon in this application for an earlier filing date under 35 USC 120.

A concise explanation of relevance of the items listed on PTO-1449 is:

- ☒ not given
- ☐ given for each listed item
- ☐ given for only non-English language listed item(s)

☐ in the form of an English language copy of a Search Report from a foreign patent office, issued in a counterpart application, which refers to the relevant portions of the references.

The Examiner is reminded that a "concise explanation of the relevance" of the submitted prior art "may be nothing more than identification of the particular figure or paragraph of the patent or publication which has some relation to the claimed invention." MPEP §609.

While the information and references disclosed in this Information Disclosure Statement may be "material" pursuant to 37 CFR §1.56, it is not intended to constitute an admission that any patent, publication or other information referred to therein is "prior art" for this invention unless specifically designated as such.

In accordance with 37 CFR §1.97(b), the filing of this Information Disclosure Statement shall not be construed to mean that a search has been made or that no other material information as defined in 37 CFR §1.56(a) exists. It is submitted that the Information Disclosure Statement is in compliance with 37 CFR §1.98 and MPEP §609 and the Examiner is respectfully requested to consider the listed references.

Respectfully submitted,



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Date: August 13, 2004

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U.S. DEPARTMENT OF COMMERCE  
PATENT AND TRADEMARK OFFICE

**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**  
(Use several sheets if necessary)

(PTO-1449)

**ATTY. DOCKET NO.**  
GC566-2-C1

**SERIAL NO.**  
10/791,093

**APPLICANT**  
Genencor International, Inc.

**FILING DATE**  
March 1, 2004

**GROUP ART UNIT**  
1614

**REFERENCE DESIGNATION**

**U.S. PATENT DOCUMENTS**

EXAM'R INITIAL		DOCUMENT NUMBER	DATE	NAME	Class	Subclass	Filing Date If Appropriate
	A1	*5,403,737	04/04/95	Abrahmsen et al.			
	A2	*5,629,173	05/13/97	Abrahmsen et al.			
	A3	*5,316,935	05/31/94	Arnold et al.			
	A4	*5,208,158	05/04/93	Bech et al.			
	A5	*5,244,791	09/14/93	Estell			
	A6	*5,316,941	05/31/94	Estell et al.			
	A7	*5,955,340	02/21/99	Bott			

**FOREIGN PATENT DOCUMENTS**

EXAM'R INITIAL		DOCUMENT NUMBER	DATE	COUNTRY	CLASS	Subclass	TRANSLAT'N
	B1	*EP 3 328 229 A1	08/16/89	EP			
	B2	*WO 00/28007	05/18/00	PCT			
	B3	*WO 00/37658	06/29/00	PCT			
	B4	*WO 91/16423	04/18/91	PCT			
	B5	*WO 96/27671	02/27/96	PCT			
	B6	*WO 97/37007	10/09/97	PCT			
	B7	*WO 99/20723	04/29/99	PCT			

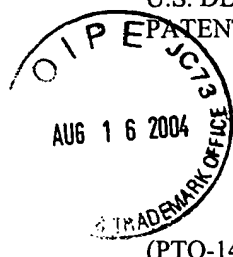
**OTHER DOCUMENTS (including Author, Title, Date, Pertinent Pages, Etc.)**

	C1	*Abrahmsen et al., "Engineering Subtilisin and Its Substrates for Efficient Ligation of Peptide Bonds in Aqueous Solution," <u>Biochemistry</u> , 30:4151-59 (1991)
	C2	*Akabas et al., "Acetylcholine Receptor Channel Structure Probed in Cysteine-Substitution Mutants," <u>Science</u> , 258:307-310 (1992)
	C3	*Alvear et al., "Inactivation of Chicken Liver Mevalonate 5-Diphosphate Decarboxylase by Sulfhydryl-Directed Reagents: Evidence of a Functional Dithiol," <u>Biochimica et Biophysica Acta</u> , 994:7-11 (1989)
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	C5	*Barbas, et al., "Papain Catalysed Peptide Synthesis: Control of Amidase Activity and the Introduction of Unusual Amino Acids," <u>J. Chem. Soc., Chem. Commun.</u> , 533-34 (1987)
	C6	*Bech et al., "Significance of Hydrophobic S <sub>4</sub> -P <sub>4</sub> Interactions in Subtilisin 309 from <i>Bacillus lentus</i> ," <u>Biochemistry</u> , 32:2847-2852 (1993)

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C7	*Bell et al., "Kinetic Studies on the Peroxidase Activity of Selenosubtilisin," <u>Biochemistry</u> , 32:3754-3762 (1993)
C8	*Berglund et al., "Altering the Specificity of Subtilisin <i>B. Lentus</i> by Combining Site-Directed Mutagenesis and Chemical Modification," <u>Bioorganic &amp; Mechanical Chemistry Letters</u> , 6:2507-2512 (1996)
C9	*Betzel et al., "Crystal Structure of the Alkaline Proteinase Savinase <sup>TM</sup> from <i>Bacillus lentus</i> at 1.4 Å Resolution," <u>J. Mol. Biol.</u> , 223:427-445(1992)
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C18	*Daly et al., "Formation of Mixed Disulfide Adducts at Cysteine-281 of the Lactose Repressor Protein Affects Operator and Inducer Binding Parameters," <u>Biochemistry</u> , 25:5468-5474 (1986)
C19	*Davies et al., "A Semisynthetic Metalloenzyme Based on a Protein Cavity That Catalyzes the Enantioselective Hydrolysis of Ester and Amide Substrates," <u>J. Am. Chem. Soc.</u> , 119:11643-11652 (1997)
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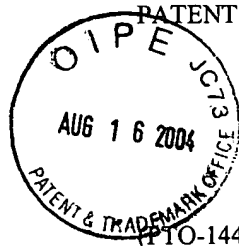
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C24	*Davis, B.G., et al., "The controlled introduction of multiple negative charge at single amino acid sites in subtilisin bacillus lentus," <u>Bioorganic and Medicinal Chemistry</u> , (1999 Nov.) 7 (11) 2293-301, XPO000892840
C25	*Davis, Benjamin G, et al., "The Controlled Glycosylation of a Protein with a Bivalent Glycan: Towards a New Class of Glycoconjugates, Glycodendriproteins," <u>Chem. Commun</u> , 2001, pp. 351-352
C26	*DeSantis et al., "Chemical Modifications at a Single Site Can Induce Significant Shifts in the pH Profiles of a Serine Protease," <u>J. Am Chem. Soc.</u> , 120:8582-8586 (1998)
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C30	*Ekberg et al., "Enzymatic Coupling of Two D-Amino Acid Residues in Aqueous Media," <u>Tetrahedron Letters</u> , 30(5):583-86 (1989)
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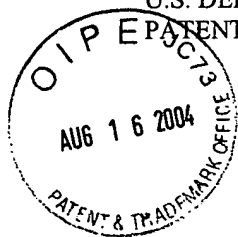
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C40	*House et al., " <sup>1</sup> H NMR Spectroscopic Studies of Selenosubtilisin," <u>Biochemistry</u> , 32:3468-3473 (1993)
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C42	*Jonsson et al., "Temperature Effects on Protease Catalyzed Acyl Transfer Reactions in Organic Media," <u>Journal of Molecular Catalysis B: Enzymatic</u> , 2:43-51 (1996)
C43	*Kaiser, "Catalytic Activity of Enzymes Altered at Their Active Sites," <u>Angew. Chem. Int. Ed. Engl.</u> , 27:913-922 (1988)
C44	*Kanaya et al., "Role of Cysteine Residues in Ribonuclease H from <i>Escherichia coli</i> ," <u>Biochem. J.</u> , 271:59-66 (1990)
C45	*Kato et al., "First Stereoselective Synthesis of D-Amino Acid N-Alkyl Amide Catalyzed by D-Aminopeptidase," <u>Tetrahedron</u> , 45(18) 5743-54 (1989)
C46	*Kawase et al., "Effect of Chemical Modification of Tyrosine Residues on Activities of Bacterial Lipase," <u>Journal of Fermentation and Bioengineering</u> , 72:317-319 (1991)
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C49	*Kirley, "Reduction and Fluorescent Labeling of Cyst(e)ine-Containing Proteins for Subsequent Structural Analyses," <u>Analytical Biochemistry</u> , 180:231-236 (1989)
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C51	*Kokubo et al., "Flavohemoglobin: A Semisynthetic Hydroxylase Acting in the Absence of Reductase," <u>J. Am. Chem. Soc.</u> , 109:606-607 (1987)
C52	*Konigsberg, "Reduction of Disulfide Bonds in Proteins with Dithiothreitol," <u>Methods in Enzymology</u> , 25:185-188 (1972)
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C54	*Lewis et al., "Determination of Interactive Thiol Ionizations in Bovine Serum Albumin, Glutathione, and Other Thiols by Potentiometric Difference Titration," <u>Biochemistry</u> , 19:6129-6137 (1980)
C55	*Liu et al., "Site-Directed Fluorescence Labeling of P-Glycoprotein on Cysteine Residues in the Nucleotide Binding Domains," <u>Biochemistry</u> , 35:11865-11873 (1996)
C56	*Lloyd, R.C. et al., "Site Selective Glycosilation of Subtilisin Bacillus Lentus Causes Dramatic Increase in Esterase Activity," <u>Biorganic &amp; Medicinal Chemistry</u> , Vol. 8, 2000, pp. 1537-1544
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C58	*Margolin et al., "Peptide Synthesis Catalyzed by Lipases in Anhydrous Organic Solvents," <u>J. Am. Chem. Soc.</u> , 109:3802-04 (1987)
C59	*Miller et al., "Peroxide Modification of Monoalkylated Glutathione Reductase," <u>The Journal of Biological Chemistry</u> , 266:19342-19360 (1991)
C60	*Moree et al., "Exploitation of Subtilisin BPN as Catalyst for the Synthesis of Peptides Containing Noncoded Amino Acids, Peptide Mimetics and Peptides Conjugates," <u>J. Am. Chem. Soc.</u> , 119:3942-47 *(1997)
C61	*Moriwara et al., " $\alpha$ -Chymotrypsin as the Catalyst for Peptide Synthesis," <u>Biochem. J.</u> , 163:531-42 (1977)
C62	*Nakatsuka et al., "Peptide Segment Coupling Catalyzed by the Semisynthetic Enzyme Thiolsubtilisin," <u>J. Am. Chem. Soc.</u> , 109:3808-10 (1987)
C63	*Nakayama et al., "Chemical Modification of Cysteiny, Lysyl and Histidyl Residues of Mouse Liver 17 $\beta$ -Hydroxysteroid Dehydrogenase," <u>Biochimica et Biophysica Acta</u> , 1120:144-150 (1992)
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C66	*O'Connor et al., "Probing an Acyl Enzyme of Selenosubtilisin by Raman Spectroscopy," <u>J. Am. Chem. Soc.</u> , 118:239-240 (1996)
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C68	*Peterson et al., "Nonessential Active Site Residues Modulate Selenosubtilisin's Kinetic Mechanism," <u>Biochemistry</u> , 34:6616-6620 (1995)
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C71	*Plettner, E., et al., "Modulation of Esterase and Amidase Activity of Subtilisin Bacillus Lentus by Chemical Modification of Cysteine Mutants," <u>Journal of the American Chemical Society</u> , (2 Jun. 1999) 121/21, 4977-4981, XPO000891274.
C72	*Plettner, Erika et al., "A Combination Approach to Chemical Modification of Subtilisin Bacillus Lentus," <u>Bioorganic &amp; Medicinal Chemistry Letters</u> (Sept. 8, 1998) Vol. 8, No. 17, pp. 2291-2296, XP0004138220

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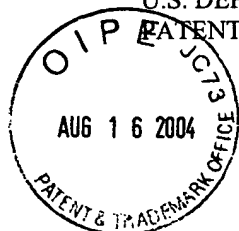
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